

Remarks

Applicants respectfully request reconsideration of the present application in view of the above amendment and following remarks. No claims have been amended or cancelled. Claim 14 has been added. Therefore, claims 1-9, 13 and 14 are pending in the present application.

Claims 1-9 have been rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,688,070 to Morelli et al. ("the Morelli reference"). Applicants respectfully traverse this rejection.

Claim 1 is directed to an apparatus including a cylindrical shaft, a hub, and at least one tapered locking key. The cylindrical shaft has at least one longitudinal keyway formed in an outer surface thereof. The at least one keyway has a bottom portion and at least two side walls. The hub has a cylindrical axial bore defining a wall in the hub and is disposable on the shaft to define a maximum distance from the keyway bottom portion to the bore wall. The wall is cylindrical about the entire surface of the axial bore. The at least one tapered locking key is adapted for insertion into the at least one keyway between the keyway bottom portion and the bore wall. In addition, the key has a pre-insertion maximum height greater than the maximum distance such that at least one of the key and the hub is deformed by the insertion whereby the hub is rotationally and axially secured onto the shaft.

The Morelli reference does not teach or suggest an apparatus having a hub with a cylindrical axial bore defining a wall that is cylindrical about the entire surface of the axial bore as recited in amended claim 1. In rejecting claim 1, the Examiner stated that the Morelli reference includes a sleeve (164) having a cylindrical axial

bore that defines a wall that is cylindrical about the entire surface of the axial bore.

See *Office Action* dated 5/3/04, pg. 2, ¶ 2. In further support of the rejection of claim 1, the Examiner stated that the sleeve (164) has a cylindrical keyway, thereby forming a cylindrical wall along the entire surface of the axial bore. See *id.* at pg. 3, ¶ 2.

Applicants respectfully disagree with the Examiner's interpretation of the Morelli reference. The sleeve (164) in the Morelli reference is best illustrated in Figure 5, which is set forth below:

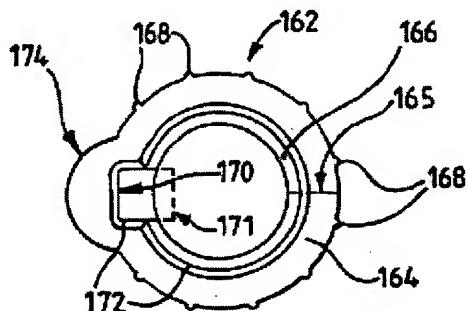


Fig. 5.

In Figure 5 of the Morelli reference, the keyway referred to by the Examiner is identified by reference numeral (170). In describing the keyway (170), the Morelli reference states, "the same rectangular cross-section as the keyway (148) is formed in the inner periphery of the sleeve (164) . . ." *Morelli*, Col. 4, lines 18-20 (emphasis added). Therefore, the Morelli reference specifically discloses that the rectangular-shaped keyway (170) is formed in the bore of the sleeve (164). This is in direct contrast to the statement in the *Office Action* dated 5/3/04 that the sleeve (164) includes a cylindrical keyway. See *Office Action* at pg. 3, ¶ 2. While the bore formed in the sleeve (164) may be partially cylindrical, the bore does not include a

wall that is cylindrical about the entire surface of the axial bore due to the rectangular-shaped keyway (170) formed therein.

By providing the apparatus as provided in claim 1, numerous advantages are realized. For instance, the rotary relationship of the shaft with the hub is not dictated by the alignment of their respective keyways. A practical application of this advantage is that the present invention allows for the independent calibration of a throttle shaft and sensor output coupled to the hub prior to fixing the rotary relationship between the shaft and the hub. See *Specification*, pg. 6, lines 16-23; pg. 7, lines 1-4. In contrast, the device in the Morelli reference does not allow for the independent rotational indexing of the shaft relative to the sleeve since the keyways (48,148, 170) must always be aligned in order to allow the key (56,171, 174) to fixedly couple the sleeve to the shaft. As a result, the position of the shaft relative to the sleeve may not be varied, which is one of the problems that the present invention intends to solve. See *Specification*, pg. 2, lines 3-7.

Since the Morelli fails to teach or suggest all of the limitations included in claim 1, Applicants request that the rejection of claim 1 be withdrawn. As claims 2-6 depend either directly or indirectly from claim 1, these claims are also not taught or suggested by the references of record for at least the same reasons set forth with respect to claim 1.

Claim 7 is directed to a method for securing a hub having a cylindrical axial bore defined by a bore wall onto a cylindrical shaft. The bore wall is cylindrical about the entire surface of the axial bore. The method includes providing at least one longitudinal keyway in the shaft, wherein at least one keyway has a bottom portion

and at least two side walls, disposing the entirely cylindrical axial bore of the hub onto the shaft to define a maximum distance between the keyway bottom portion and the bore wall, providing at least one wedging means, and inserting the at least one wedging means into the at least one keyway between the keyway bottom portion and the bore wall.

For at least the same reasons set forth above with respect to claim 1, the Morelli reference does not teach or suggest a method that includes disposing an entirely cylindrical axial bore of a hub onto a shaft as recited in amended claim 7. As stated above, the inner periphery of the sleeve in the Morelli reference is not entirely cylindrical because of the rectangular-shaped keyway (170) defined therein. Thus, Applicants respectfully request that the rejection of claim 7 be withdrawn. As claims 8 and 9 depend from claim 7, Applicants request that the rejection of these claims also be withdrawn for at least the same reason set forth with respect to claim 7.

Claims 7-9 have also been rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 1,866,112 to Kindelmann et al. ("the Kindelmann reference"). Applicants respectfully traverse this rejection.

The Kindelmann reference does not teach or suggest a method that includes providing a longitudinal keyway in a shaft, wherein the keyway has a bottom portion and two side walls as recited in claim 7. While the shaft (12) in the Kindelmann reference includes two opposing side walls positioned adjacent to the key (17), the shaft (12) does not include a bottom portion to form the keyway recited in claim 7. See *Kindelmann*, FIGS. 1-4. The key (17) actually extends into an interior bore (14) of the shaft (12) and comes into contact with the tapered surface (16) of the

threaded member (15) to couple the shaft (12) to the hub (10). The use of the additional component (i.e., threaded member (15)) to couple the shaft (12) to the hub (10) could potentially result in an increase in assembly time and production cost. Since the Kindelmann reference fails to teach all the limitations included in claim 7, Applicants request that the rejection of claim 7 be withdrawn.

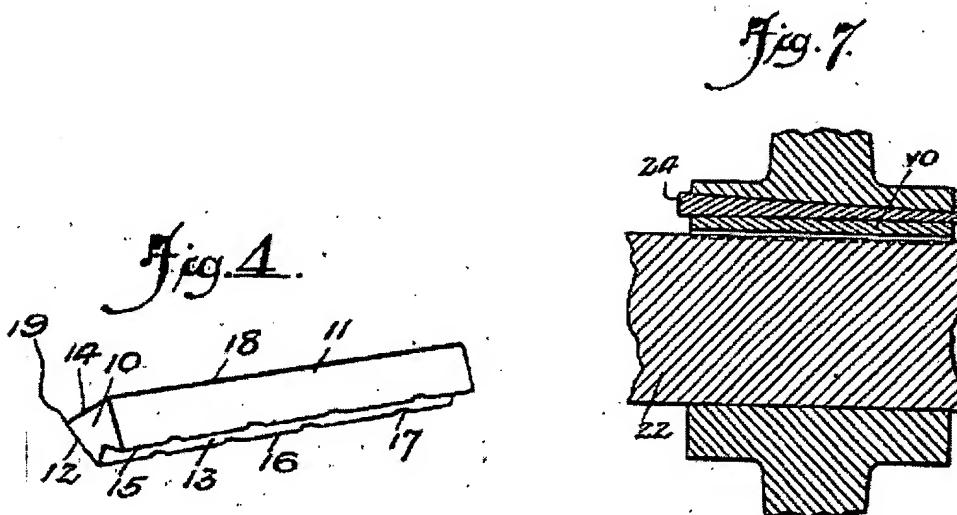
As claims 8 and 9 depend from claim 7, Applicants request that the rejection of these claims based on the Kindelmann reference also be withdrawn for at least the same reason set forth above.

Claim 13 has been rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 1,560,399 to Preston, Sr. ("the Preston reference").

Claim 13 is directed to an apparatus for securing a hub to a shaft including a shaft having an entirely cylindrical outer surface, a hub and at least one longitudinally tapered locking key. The hub has an axial bore that defines a wall in the hub and has at least one longitudinal keyway formed in an inner surface thereof. The at least one keyway also has a bottom portion. The hub is disposable on the shaft to define a maximum distance from the keyway bottom portion to the outer surface. Further, the at least one longitudinally tapered locking key is adapted for insertion into the at least one keyway between the keyway bottom portion and the shaft surface. The at least one key has a pre-insertion maximum height greater than the maximum distance such that at least one of the key and the shaft is deformed by the insertion, whereby the hub is rotationally and axially secured onto the shaft.

The Preston reference does not teach or suggest an apparatus having at least one longitudinally tapered locking key as recited in amended claim 13. In

rejecting claim 13, the Examiner stated that the Preston reference includes a key (10) "having a tapered lengthwise edge." *Office Action*, pg. 6, ¶ 4. Applicant's disagree with the interpretation that the Preston reference discloses a locking key that is tapered along its longitudinal axis. The longitudinal axis of the key (10) in the Preston reference is best illustrated in Figures 4 and 7, which are set forth below:



The definition of a taper is to progressively narrow or become smaller toward one end. See WEBSTER'S NINTH NEW COLLEGiate DICTIONARY 1206 (1985). As best seen in FIGS. 4 and 7 of the Preston reference, the sides (11, 12) of the key (10) do not narrow or become smaller along its longitudinal axis, which extends between the left and right ends of the key (10). Instead, the sides (11, 12) of the key (10) remain at a substantially constant height along the longitudinal axis of the key (10). Thus, the Preston reference fails to teach or suggest each limitation in claim 13, and Applicants respectfully request that the rejection of claim 13 be withdrawn.

New claim 14 depends from claim 1 and states that the at least one locking key is longitudinally tapered. As stated above, none of the references of record teach or suggest this feature. Applicants submit that claim 14 is in proper form for allowance.

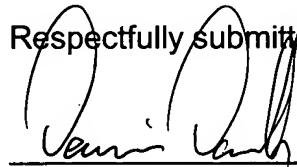
Conclusion

In light of the foregoing, Applicants submit that claims 1-9, 13 and 14 are in condition for allowance and such allowance is respectfully requested. Should the Examiner feel that any unresolved issues remain in this case, the undersigned may be contacted at the telephone number listed below to arrange for an issue resolving conference.

Applicants do not believe that any fee is due at this time, however, the Commissioner is authorized to charge any fee that may have been overlooked to Deposit Account No. 10-0223.

Dated: 8/3/04

Respectfully submitted,



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New claim 14 depends from claim 1 and states that the at least one locking key is longitudinally tapered. As stated above, none of the references of record teach or suggest this feature. Applicants submit that claim 14 is in proper form for allowance.

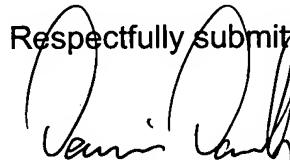
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